one of them in *vacuo*, the other in the free Air, there was let fall into both at the ſame time two equal parcels of *Lime*, one into each; and it appear'd, that that which was in *vacuo* did indeed throw up ſome big bubbles, but yet fewer of them than that which was in the Air: And having taken it, an hour after, out of the Recipient, and ſtirr'd the *Lime*, it was found to have only the conſiſtence of Dirt, whereas the other had the conſiſtence of ſlecked Lime. The reaſon of which may perhaps be, that the Volatil Salts of the *Lime* do exhale whilſt the Recipient is emptying.

There was alſo ſome Plaiſter of *Paris* ſlecked in *vacuo*, and the Ebullition of it did there appear much more than it doth in the open Air. When it is not touched, the bubbles that iſſue out leave great holes in it, and then it ſettles very un-even; but taking care to ſtir it until the bubbles be come forth, and preſſing it when it begins to ſettle, it becomes very ſmooth, and hath not ſo many little holes as the common Plaiſter.

A particular account, given by an anonymous French *Author in his book of the* Origin of Fountains, *printed* 1674 *at* Paris; *to ſhew, that the Rain and Snow-waters are ſufficient to make Fountains and Rivers run perpetually.*

IN order to give a groſs Eſtimat of the quantity of Rain *, compared with the quantity of Water running away in Springs and Rivers; it will be neceſſary firſt to agree of the way of meaſuring theſe two ſorts of Water. Thoſe that make profeſſion of governing and conveying Spring-waters, ſay, that a cubick inch of water yields in twenty four hours 144 *muids*, (the name of a *French* meaſure, holding 280 *French* pints;) others ſay, it yields but 70 of that meaſure. For my part, I have reaſon to believe, that it yields 83 of this meaſure, and follow thoſe that ſay, that a Veſſel of two foot deep, long and broad, holds one *muid* of Water.

* The like to which hath been attempted here, and propoſed to the *R. Society*, ſome years ſince, by Sr. *Chr. Wren*, who by the contrivance of a Rain-bucket had taken an account of all the Water that fell for a conſiderable time; and by his Weather-clock had, among other particulars, not only taken in the meaſuring of the quantity of Rain that falls, but alſo the time when it falls, and how much at each time. Which Inſtrument, if put into practice, would be of excellent Uſe, foraſmuch as it may alſo ſerve, by ſome additions made thereunto by *M. Hook*, to record the weight of the Air, the drought, moiſture, heat and cold of the Weather, the Sun-ſhine, the quarters and ſtrength of the Winds: And all this to be performed by one only motion, driving all the parts of the Inſtrument; which is therefore the more conſiderable, that it ſelf records its own effects.

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This being ſuppoſed, it follows, that a Veſſel, which contains 83 *muids* of Water, is able to furniſh in twenty four hours ſo much as will make an *Inch* of water run continually. And ſo, if a Conſervatory ſhould hold 3378 *muids* of water, it would furniſh for a whole year a ſufficient quantity to make an *Inch* of water run conſtantly: And if it were as big again, it would make run two, and ſo on more or leſs in proportion. But here I ſuppoſe an Equality in the running, though I am not ignorant, that the Conſervatory being full, the water will then run out with more velocity, and conſequently in greater quantity, than when 'tis near empty. But this being only to make the matter better underſtood, I ſhall not ſtand upon this preciſeneſs.

But then for the meaſure of the Rain and Snow-water, I ſhall tell you, that as to the Obſervations which I have made my ſelf of the quantity of ſuch water, I have found, that from *Octob.* 1668 to *Octob.* 1669, there had fallen ſo much of it, as amounted to the height of 18 inches 7 lines; and from the ſame Month of 1670 to the ſame Month 1671, there had fallen only ſo much as came to the height of $8\frac{1}{2}$ inches; and from *Januar.* 1673 to *Januar.* 1674, to the height of $27\frac{1}{2}$ inches. Of which, taking the *medium*, we have 19 inches end $2\frac{1}{3}$ lines.

This ſuppoſed, we muſt for our purpoſe meaſure or make an Eſtimat of ſome River, as it runs from its very ſource to a place where ſome Rivolet enters into it, and ſee, whether the Rain-water that falls about the courſe thereof, if it were put into a Conſervatory, would be ſufficient to make it run a whole year.

I have looked upon and conſidered the River of *Seine* in its courſe from the ſource of it unto *Ainay le Duc*, where enters a Rivolet that ſwells it. And this I ſhall take for the ſubject of the *Examen* I intend to make.

The courſe then of this River from its Spring to the ſaid *Ainay le Duc* is about three leagues long, and the ſides of its courſe extend themſelves on the right hand and the left about two leagues on each ſide, where there are other little Rivers that run another way: And, ſince that theſe Rivolets need Water to maintain them as well as the *Seine*, I will count but half that ſpace of the ſides, and ſay, that the place where the *Seine* paſſes, hath from its ſource to *Ainay le Duc*, three miles long, and two miles large. Whereupon I ſay further, if a Conſervatory were made of this bigneſs, it would be ſix leagues ſquare in ſurface, which being reduced to fathoms, would

would, according to the meaſure fixed above, make 31 millions and 245144 fathoms in ſurface. In this Conſervatory imagine, that during a whole year there has fallen Rain to the height of 19 inches $2\frac{1}{3}$ lines, as was ſaid before. This height of 19 inches and $2\frac{1}{3}$ lines gives 280 millions 899942 *muids* of water, or thereabout, according to the meaſure ſuppoſed.

All this Water thus collected in the quantity juſt now expreſſed, is that ſtock which is to ſerve to make this River run for a whole year, from its ſource to the place before-named, and which muſt alſo ſerve to ſupply other occaſions and loſſes, ſuch as are the feeding of Trees, Herbs, Vapors, and extraordinary ſwellings of the River whilſt it rains, and deviations of the water running another way.

Concerning the meaſure or eſtimate of the water of this riſing River, it would be difficult to find it juſt and preciſe, and to determine what quantity it furniſhes. Yet ſo far as I was able to judge, it can have no more than a 1000 or 1200 inches of water alwaies running, compenſating the leſſer quantity it hath at its ſource with the greater it hath towards *Ainay le Duc*: The which I ſo judge by the compariſon I make of theſe Waters with thoſe of the River of the *Gobelins*, in the condition wherein it is towards *Verſailles*, where it hath fifty inches of water, according to the meaſure taken of it. So that I eſteem, it will be enough to allow twenty four or twenty five times as much to *our* River. For the Channel of it is to be four or five fathoms large, and for depth 'tis but ſhallow; it carries no Boats, and ſerves only to float down ſome looſe Billets.

Theſe particulars being thus ſuppoſed, I ſay, that according to the meaſures we have agreed upon, 1200 inches of water do furniſh in twenty four hours, after the rate of 83 *muids* of water to an inch, they furniſh, I ſay, 99600 *muids* of water; wherefore, for a whole year, which is near 366 times as much, they will furniſh 36 millions 453600 *muids*.

This River then ſends away within its banks, in a year, no more than about $36\frac{1}{2}$ millions of *muids* of water. But taking this quantity out of the 280 millions that are in the Conſervatory above deſcribed, there will remain yet above 188 millions of *muids*, which amounts to almoſt five times as much, and which ſerves to furniſh for the loſſes, diminutions, and other waſtes, above taken notice of. So that there needs but the ſixth part of

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the Rain and Snow-water that falls in a year, to run continually through the whole year.

I am well aware, that this deduction is not ſure; but who can give a ſurer? However ſuch as it is, I think it is more ſatisfactory than a bare Negative, as is that of thoſe, who pretend, it rains not enough to furniſh ſufficient quantities of water for the conſtant running of Rivers.

Now then, if theſe Rain-waters are ſufficient to make one River run, they may alſo ſuffice for all the reſt in proportion, conſidering eſpecially, *firſt*, what remains for waſte, which is ſuperabundant, and *ſecondly*, what little ſpace I allow to both ſides of the River's courſe, which is but of one league on each ſide. For, Rivers are not commonly two leagues near one another.

It may be objected, *that there are Countries where it rains but ſeldom, and ſomewhere it rains not at all, and yet there are conſiderable Rivers.* But I anſwer, that the Rivers of thoſe Countries, where it rains but ſeldom, do not run continually, being only big in Winter, but in Summer almoſt quite dried up. The reaſon of both which effects is, that they being near ſome high Mountains whence they come, the Snow that falls in abundance on thoſe Hills, and is melted afterwards, is able, as long as that water laſts, to make them run abundantly in Winter, leaving them dry when it ceaſes in Summer.

As for the Countries where it rains not at all, there are but few of them in the World. The *Torrid Zone* (where that may be more true than any where elſe) is a Climat abundantly moiſtned with Rains twice a year, and it may be more than theſe Northern Countries, at leaſt in greater plenty at certain Seaſons. But if there ſhould be any Countries where no Rain at all ſhould fall, that will not hinder the running of Rivers there, becauſe they may have their ſources in other Countries where it rains, as the *Nile* in *Egypt*, where it rains not.

A Letter of the Ingenious Mr. Jeſſop *of* Broomhal *in* York-ſhire, *containing a further account of Damps in Mines, promiſed in* Numb. 117. *of theſe Tracts.*

SIR,

IN order to give Mr. *Boyle* and you ſome ſatisfaction to your laſt Letter, I went to *Wingerſworth* this laſt week: That which I ſaw was little, becauſe a great part of the Pit was filled up; but I found two of the Colliars in the Pits adjoyning, who had been

ſcorched